The effect of polymer additives on flowing cells through capillaries[1] LAILAI ZHU, KTH Mechanics, Linne flow centre, Royal Institute of technology, Sweden, LUCA BRANDT, KTH Mechanics, Linne flow centre, Royal Institute of technology — It has been suggested that low concentration of long-chain polymer potentially cause benefit in hemodynamics. The effect of polymer additives on blood flow at low Reynolds number is not well studied, albeit well-known for drag reduction in turbulent flow. We adopt a novel general geometry Ewald-like method (GGEM) recently developed[2] to study the fluid-structure interaction. GGEM method can be regarded as an accelerated implementation of boundary integral method, or a variant of immersed boundary method in the Stokesian regime. We perform three dimensional simulations to study the effect of polymer additives on the dynamics of a periodic file of red blood cells (RBCs) through a capillary tube. Fluid motion is solved by spectral element method and solid mechanics of cell membrane by spectral method based on spherical harmonics. Brownian dynamics is used for the polymer molecules.

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